to be studied. We established that our preparations are homogeneous, with no evidence for local variations in intensity of weak reflections, and that doubling is observed in all zones when it is expected for a 24.6-Å unit cell. In particular *hhl* (inadvertently printed as *hkl* in ref. 3) reflections satisfying $h+l=2n$ were observed. As it is not easy to assign unambiguously space groups using electron diffraction alone[4] we have sought further information concerning space group assignment. Surprisingly, rather cogent evidence that the space group is not $Fm\bar{3}c$ comes from Smith and Pluth who meaasured 111; 3,3,17; 7,7,23; 13,13,11 and 15,15,15 intensities for dehydrated Na-A (ref. 1) and 999; 31,1,1, 21,21, 9 for dehydrated K-A (ref. 2). All of these reflections contradict the *c*-glide operation of $Fm\bar{3}c$. Smith and Pluth suggest that these reflections arise from displacements of cations and/or framework atoms, dismissing the NMR results[6–8], which strongly implicate 3:1 ordering, on the grounds "that simple comparison of NMR data from one zeolite sample with another is obviously unreliable" and that the model proposed[6,7] does not lead to a 24.6-Å cell. The NMR results are especially significant as careful calibrations of the chemical shifts, using known aluminosilicates as standards[8], show the technique is extremely sensitive to the Si–O–Si (Al) coordination. The technique yields results for bulk specimens and merits at least the respect accorded to a crystal structure determination on one or two carefully selected X-ray specimens. We have pointed out[4] that the model proposed by Engelhardt *et al.*[6,7], based on 3:1 ordering, yields an isometric cell with $a=12.3$ Å and space group Pm3, and suggested that further NMR and diffraction studies, encompassing a range of Si/Al ratios, should prove instructive, as cell doubling may arise to accommodate excess Al (or Si)[4,5].

New data on Si, Al ordering in zeolites have emerged from neutron diffraction studies, carried out in collaboration with A. K. Cheetham. Three dehydrated samples, covering a range of Si/Al ratios, were studied. Our analysis shows that the neutron diffraction patterns cannot be indexed using space group $Fm\bar{3}c$. However, refinement of the structure is proceeding saisfactorily using a space group having rhombohedral symmetry. Analysis of the geometrically possible Si, Al distributions required by this space group, and which maintain 3:1 ordering, required by the NMR results, and which give 24.6-Å cells, as required by the X-ray and electron diffraction results, leads to a new description of the structure, details of which are to be given elsewhere[9].

We believe, therefore, that the 4:0 ordering scheme advocated by Smith and Pluth for Linde A must be viewed with reservation, at least for the bulk of Na-A preparations. Application of the above-mentioned range of techniques to other zeolites, where novel ordering schemes may be uncovered, is indicated.

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Modern adaptations in orang-utans?

SMITH AND PILBEAM'S[1] letter, proposing that orang-utan sex differences—body size and certain features of dental and craniofacial morphology—cannot be explained by the species' modern adaptations and thus are 'remnants' of a more terrestrial Pliocene pattern, states that sexual selection among orang-utans is not clearly indicated by field observations, citing Horr[2] to the effect that "direct evidence for male competition in the form of dominance or aggressive encounters is limited".

The Tanjung Puting study[3], now in its ninth year, indicates that all adult male-male encounters involve either aggression or avoidance as do most contacts between sub-adult and adult males. Aggression is the invariable response when two adult males encounter one another in the presence of an oestrous female. The large size of orang-utan males seems to be the result of sexual selection as there is intense male–male competition for oestrous females and female selection of males during consortships[3,4]. In addition, several workers have found orang-utan males and females using differential proportions of resources[3–5] and at least one[3] has argued for an ecological separation of the sexes which may help explain sex differences as well.

Several features of orang-utan dental and craniofacial morphology are at variance with those characteristic of other arboreal frugivores—this can be explained by the fact that orang-utans spend an average of 40% of their feeding time on bark, young leaves, insects and other foods[3]. During some months orang-utans spend less than 20% of their foraging time consuming fruit. One instance of meat-eating among a wild orang-utan population has just been reported (Sugardjito, personal communication). Furthermore, some of the fruits (for example *Mezzettia leptopoda*) eaten by orang-utans are extremely hard. Chimpanzees use tools to open very hard fruits[6], but orang-utans spend hours opening hard nuts with their molars, which may account for their exceptionally thick molar enamel.

Finally, note that orang-utans can be quite terrestrial, bringing them closer to chimpanzees in this regard than is usually realized[3]. At Tanjung Puting adult males averaged 66 min per day on the ground with one male spending up to 6 h per day on the forest floor. A clear understanding of modern orang-utan adaptation suffices to explain most morphological features cited by Smith and Pilbeam as indicative of a more terrestrial Pliocene pattern. In regards to the fossil evidence for terrestrial patterns, we need post-cranial remains of ancestral orang-utans before we can discuss such patterns.

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SMITH AND PILBEAM REPLY—The data reported by Galdikas are interesting, but the implications for our argument are unclear. What is directly known of ancestral orang-utans (their teeth and something of their distribution) is suggestive of a more terrestrial niche than that usually described for the extant species. Whether or not features of the extant animal support this hypothesis is secondary because one would expect the modern species to be more or less adapted to what it does. Also, whether or not the behaviours observed by Galdikas are sufficient to explain the morphological features in question is entirely speculative.

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